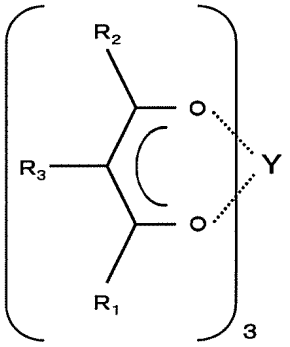
CLAIMS

[1] A catalyst for polymerization of conjugated diene, comprising: (A) an yttrium compound; (B) an ionic compound including a non-coordinate anion and a cation; and (C) an organometallic compound including an element selected from the groups 2, 12 and 13 of the periodic table.

[2] The catalyst for polymerization of conjugated diene according to claim 1, wherein the (A) yttrium compound comprises an yttrium compound having a bulky ligand in the following general formula:

[Chemical Formula 1]



where R_1, R_2, R_3 denote hydrogen or a substituent having 1-12 carbon atoms; O denotes an oxygen atom; and Y denotes an yttrium atom.

[3] The catalyst for polymerization of conjugated diene according to claim 1, wherein the (A) yttrium compound comprises a carboxylate.

[4] The catalyst for polymerization of conjugated diene according to any one of claims 1-3, wherein the conjugated diene polymers include a cis-1,4-polybutadiene having 90 % or more of a cis-1,4 structure.

[5] A method of manufacturing conjugated diene polymers, comprising polymerizing a conjugated diene using the catalyst for polymerization according to any one of claims 1-4.

[6] The method of manufacturing conjugated diene polymers

according to claim 5, wherein the step of polymerizing the conjugated diene polymer includes adjusting a molecular weight by a compound selected from (1) hydrogen, (2) a hydrogenated metallic compound and (3) a hydrogenated organometallic compound.

[7] The method of manufacturing conjugated diene polymers according to claim 6, wherein the hydrogenated organometallic compound comprises a dialkyl aluminum hydride.

[8] A rubber composition for tires, comprising:

(a) 10-90 % by weight of a high-cis polybutadiene derived from polymerization of 1,3-butadiene in the presence of a catalyst comprising (A) an yttrium compound, (B) an ionic compound including a non-coordinate anion and a cation, and (C) an organometallic compound including an element selected from the groups 2, 12, 13 of the periodic table;

(b) 90-10 % by weight of a diene-based rubber other than the (a) high-cis polybutadiene; and

(c) 1-100 parts by weight of a rubber reinforcer mixed in 100 parts by weight of a rubber component (a)+(b).

[9] The rubber composition for tires according to claim 8, wherein the high-cis polybutadiene has a molecular weight adjusted by a compound selected from (1) hydrogen, (2) a hydrogenated metallic compound and (3) a hydrogenated organometallic compound.

[10] The rubber composition for tires according to claim 9, wherein the hydrogenated organometallic compound comprises a dialkyl aluminum hydride.

[11] The rubber composition for tires according to any one of claims 8-10, wherein the high-cis polybutadiene comprises a cis-1,4-polybutadiene having 90 % or more of a cis-1,4 structure.

[12] A rubber composition for golf balls, comprising:

a base polymer including a high-cis polybutadiene derived from

polymerization of 1,3-butadiene in the presence of a catalyst comprising (A) an yttrium compound, (B) an ionic compound including a non-coordinate anion and a cation, and (C) an organometallic compound including an element selected from the groups 2, 12, 13 of the periodic table; and
10-50 parts by weight of a crosslinking coagent mixed in 100 parts by weight of the base polymer.

[13] The rubber composition for golf balls according to claim 12, wherein the high-cis polybutadiene has a molecular weight adjusted by a compound selected from (1) hydrogen, (2) a hydrogenated metallic compound and (3) a hydrogenated organometallic compound.

[14] The rubber composition for golf balls according to claim 13, wherein the hydrogenated organometallic compound comprises a dialkyl aluminum hydride.

[15] The rubber composition for golf balls according to any one of claims 12-14, wherein the high-cis polybutadiene comprises a cis-1,4-polybutadiene having 90 % or more of a cis-1,4 structure.